1. EUROPEAN SYMPOSIUM ON SATELLITE REMOTE; SENSING III

REMOTE SENSING FOR GEOLOGICAL EXPLORATION AND SOIL ANALYSIS

CHAIR: Eugenio Zilioli

2. Volcanic Hazards Survey in the Trans Mexican Volcanic Belt

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4. Oral Presentation

5. A substantial percentage of the world's population (>10%) lives in areas vulnerable to the negative effects of future volcanic activity. This is especially true in Mexico, where within the Trans Mexican Volcanic Belt (TMVB) 1/2 of the country's 90 million inhabitants live. In the valleys of Mexico City, Toluca, and Puebla, over 3(I million people live within 100 km of Popocatepetl vo].cane). The TMVB is a 1000 by 200 km area, dotted with hundreds of volcanoes and volcanic centers above the subduction zone off of the Pacific margin. Most of the area has been poorly studied, and the volcanic history is largely unknown, Our recent past work has focused on the volcanoes near Mexico City, including Popocatepetl, Jocotitlan, and La Malinche. Our approach is to combine interpretations of satellite images, fi eld work and mapping, laboratory analysis, and age dating to elucidate the volcanic history and evaluate the potential eruptive hazards. We have found that Popocatepetl had 2 gigantic eruptions, 1100 and 2500 years ago, sending an eruption column into the stratosphere, triggering major lahars that buried settlements and ceremonial centers. Jocotitlan was found to have had major effusive activity only 300 years ago. And the once-thought extinct La Malinche volcano in fact erupted 2000 years ago, with pyroclastic flows and surges in the vicinity of Puebla.

We have assembled a digital mosaic of 11 Landsat Thematic images to serve as a mapping base for our reconnai ssance survey of the rest of the entire TMVB. From the mosaic, 1 :250,000 prints are produced for interpretation. Perspective views are created with the addition of digital elevation data to assist_ in analysis. Combining the image results, with information from the literature, we are evaluating the potential activity of all the volcanic centers. The interpretations guide us to key areas for field work and sampling for radiometric age determinations. One result of this work is a volcanic hazards map; a published example will be shown and discussed.

8. Michael Abrarns received his B.S. and M.S. degrees from the California Institute of Technology in 1970 and 1973. Since

joining the Jet Propulsion Laboratory in 1973, he has concentrated on applications of remote sensing to geologic studies. His work has included studies related to mineral exploration, ophiolite formation and alteration, and evacuation of new aircraft. and satellite instruments. Currently he is involved in volcano hazards investigations in Mexico, Italy, and Russia.